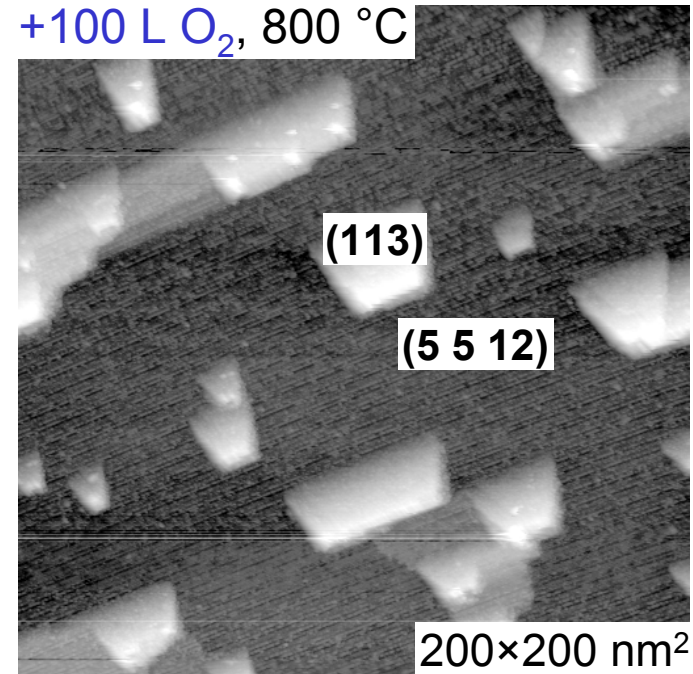
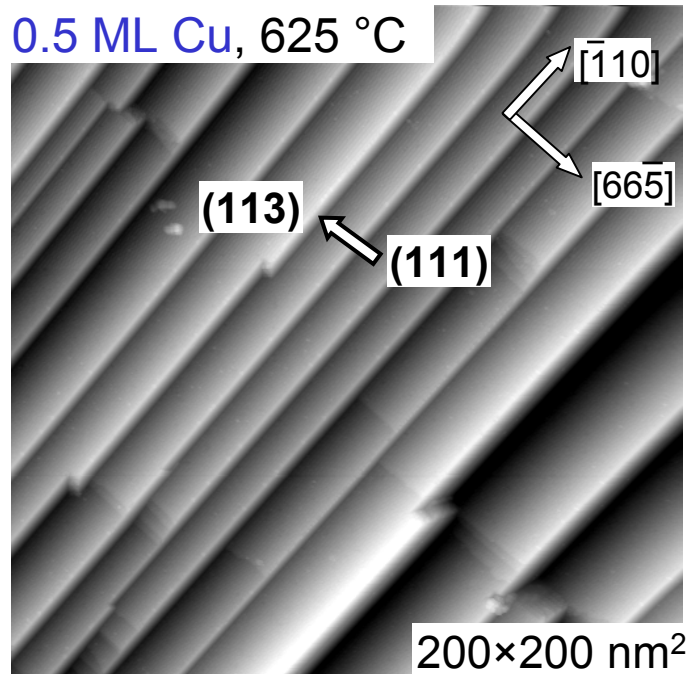


Nanometer Surface Structures



- Our research tailors the surface morphology of **silicon** surfaces at the **nanometer scale** for possible applications in semiconductor devices.
- The **left image** shows a surface with **nanoscale sawtooths** created by depositing copper on a special "tilted" silicon wafer known as Si(5 5 12).
- The **right image** is this same surface **after etching** at high temperatures using oxygen to selectively remove the sawtooths and **create isolated islands**.

The controlled creation of nanometer-scale surface structures may find applications in future semiconductor devices. Our recent scanning tunneling microscopy (STM) studies show that Cu deposited onto Si(5 5 12) and annealed forms a nanoscale sawtooth morphology. The STM image on the left shows a sample prepared by deposition of 0.5 monolayers (or atomic layers) of Cu onto Si(5 5 12) and annealing for 5 min at 625 °C. The sawtooth facets are composed of wide (113) facets opposed by narrow (111) segments. The image on the right shows the effect of O₂ (oxygen) exposure of this surface at high temperatures. The oxygen causes etching of the sawtooths, where small islands remain that are caused by the nucleation of small oxide-induced pinning sites.

J. C. Moore, P.H. Woodworth, J.L. Skrobiszewski, Surface Science, submitted (2002).

VCU Outreach: National Youth Sports Program



Playing with **iron filings**.



Turning a **spinning wheel**.



"Jumping rings" on a solenoid.

Dr. Baski and VCU physics majors teach physics using "cool demos" to underprivileged kids enrolled in VCU's summer National Youth Sports Program.

During July 2001, Dr. Baski organized three lessons on physics to be taught during the National Youth Sports Program held at Virginia Commonwealth University. These lessons included hands-on demonstrations (or “learning stations) of concepts in mechanics, electricity and magnetism, and light. These learning stations are shown in the slides, e.g. playing with magnets and turning a spinning bicycle wheel. There were over 100 underprivileged students enrolled in this program and they attended the lessons in groups of ~20 students according to their age groups (12 to 16 yrs.) Four undergraduate physics majors helped Dr. Baski to show the demonstrations and the children rotated between three to four learning stations during each lesson. The program was so successful that we decided to visit Richmond City elementary schools in the Fall and use the same stations. This program is now to be funded by an Eisenhower grant during the 2002-03 school year as part of a development program for increasing the science skills of children in Richmond.

VCU Outreach: Visits to Fox Elementary



Playing with magnets.



Torquing a bicycle wheel.



Investigating a gyroscope.

Dr. Baski and VCU physics majors teach physics using "cool demos" to 3rd graders at Richmond City's Fox Elementary School.